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PROCEEDINGS

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DISTRICT OF COLUMBIA DIPTERA: SYRPHIDÆ.

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INTRODUCTION.

Because of the conspicuous coloration of many forms, their frequency about flowers, the wonderful similarity of certain species to wasps and bees, the remarkable larvae of *Eristalis* and *Microdon*, the connection of one form with the Bugonia myth, and the economic importance of various species, the Syrphidæ are considered one of the most interesting of the families of Diptera. The excellent revision* of the family by Dr. S. W. Williston has made them available for study to all who collect flies; it is therefore natural that the list of Washington Diptera should begin with this family.

The habits of the Syrphidæ are of such a varied nature that it is not possible to thoroughly investigate the Syrphid fauna of a given locality in a few years. Certain species occur very sparingly in the early spring, when little collecting is done, while others occur only late in the fall. A number are very local, and if the right spot is not examined at the right time the species will not be found in years of collecting. Various species appear to be really rare. A considerable number are very expert on the wing, and the collector, by no means, captures all he sees. Moreover in recent years it has become apparent that in several genera there are more species than have been customarily recognized, some of which are not easily distinguished in the field. The area covered by the present list is

* Bul. 31, U. S. Nat. Mus., 335 pp., 12 pls., 1886.

that ordinarily considered as belonging to the flora and fauna of the District of Columbia, namely, all localities within about a 15-mile radius from the Capitol. However, insect collecting has not been done with equal thoroughness in all parts of this region. The Potomac Valley and the Falls Church region have been much more extensively collected than other parts of the vicinity. It is, therefore, certain that this list is far short of completeness. It compares favorably, however, with lists given for entire States, and therefore is entirely adequate for indicating the character of the fauna of an area so limited as ours.

Collecting Syrphidæ in the vicinity of Washington dates back many years; Baron C. R. von Osten Sacken collected here from 1856 to 1862, and perhaps occasionally later, and from this material several species were described by Hermann Loew. Their material is in the Museum of Comparative Zoology. Later Mr. Theo. Pergande collected generally around here, largely in the Potomac valley; he sent his Syrphidæ to Dr. Williston and the specimens are now in the National Museum. About 1890 Mr. C. H. Tyler Townsend collected near Washington and published a list of 18 species of Syrphidæ; his specimens are in the University of Kansas collection. Later, the senior author began collecting here and in succeeding years was joined by the others. The material collected by Banks is in his private collection; that collected by Greene in the collection of Forest Insects, Bureau of Entomology, and the records are made available through the kindness of Dr. A. D. Hopkins. The specimens gathered by McAtee, Dr. A. K. Fisher, Messrs. W. D. Appel, L. O. Jackson, and a few others, are in the Biological Survey. Those obtained by Shannon are in the National Museum, and here also are specimens collected by various other entomologists during the last 15 or 20 years. Among these may be mentioned D. W. Coquillett, H. S. Barber, D. H. Clemons, J. C. Crawford, F. Knab, J. R. Malloch, and W. V. Warner. Mr. F. R. Cole has generously furnished us with the records of Syrphidæ collected by him, and Mr. W. R. Walton has kindly read the manuscript and added notes on the basis of his collection.

Every collector who examines his vicinity carefully, comes to the conclusion that he is on the border of zoological regions; for he finds species he did not expect, whose previously known distribution was wholly southern, northern, western or eastern.

Washington is no exception. For example, *Xylota marginalis* is of such a distinctly northern distribution, its capture here was a great surprise; similarly *Volucella vesiculosa*, *V. obesa*, and *Meromacrus cruciger* are so characteristically southern that none would expect them here; likewise *Eristalis latifrons* and *Platychirus chaetopodius* are typical of western conditions.

However, there are cases in which of two closely allied forms occurring in the north, only one is found here. For example, *Eristalis meigenii* and *E. arbustorum* are closely related and occur together in various parts of the north; nevertheless all specimens we take here (and commonly) are *E. arbustorum*; *Helophilus latifrons* and *H. similis* present another case; all we get here (and also commonly) are *H. similis*. Yet from the known distribution one would expect both species here. There are evidently laws of distribution; but distribution depends on such a complicated set of conditions, even outside of temperature and moisture, that we can not with present knowledge predict occurrence.

The total number of species in the present list is 136. There are also 2 named varieties. Of this number three, namely, *Paragus dimidiatus*, *Xanthogramma divisa*, and *Helophilus divisus*, are of uncertain specific standing; two, *Sphegina campanulata* and *Helophilus lunulatus*, are not certainly identified (although the latter, whatever its identity, is additional to the other species of the genus listed); and one, *Merodon equestris*, does not have an absolutely clear title to a place in the list. The net total of species may therefore be placed at about 131. For comparison it may be stated that the number of species of Syrphidæ listed for New Jersey* is 132, with 2 named varieties. The latter list contains two synonyms, namely, *Chilosia tristis* and *Xylota tuberans* (perhaps *Helophilus divisus* should be added), so that the net total is about 130.

Members of the Washington Biologists' Field Club have planned and have in part accomplished the cataloging of the fauna of Plummers Island, Md., the home of the club. The present list obviates the need of a publication on the Syrphidæ. Seventy of the species herein cataloged have been taken upon Plummers Island. The records quoted indicate which species

*Johnson, C. W. in "The Insects of New Jersey," Ann. Rep. N. J. State Museum, 1909 (1910), pp. 762–771.

these are, except in the case of the forms of general distribution for which no specific records are given. All of these common species have been collected on the island, except *Microdon fuscipennis*, *Helophilus distinctus* and *H. chrysostomus*, and these three have all been taken on the Maryland shore near the island. The number of additional species (including the three just mentioned) that have been collected along the Potomac River from Great Falls to Little Falls, the area most closely related faunistically to Plummers Island, is 39. Specific records for all of these are given.

The 27 species not included in the above categories are almost equally divided between Beltsville, Md., Washington, D. C., and Falls Church, Va., an indication of the number of types of collecting grounds in our area.

ANNOTATED LIST OF SPECIES.

Microdon Meigen.

M. AURULENTUS Fabricius.—Great Falls, Va., June 27, 1906, D. H. Clemons.

M. COARCTATUS Loew.—Originally described from the District of Columbia. Glencarlyn, Va., June 11, in open meadow; Falls Church, Va., June 11, 1916, Banks. Larvae collected by T. E. Snyder in an ant's nest under bark of chestnut oak log at Difficult Run, Va., July 4, 1916, pupated July 5, and adults emerged from July 10 to 12, Greene.

M. CRAIGHEADI Walton.—Beltsville, Md., July 26, 1914, L. O. Jackson.

M. FUSCIPENNIS Macquart.—Apparently the most common species of the genus; has been taken in all sections of our territory from June 12 to September 27. Flies low, hardly over a foot above the ground.

M. GLOBOSUS Fabricius.—Virginia, June 27, 1880, Theo. Pergande; Great Falls, Va., June 25, 1915, September 26, 1913, Greene; Glencarlyn, Va., July 2, 1916, Banks; Plummers Id., Md., July 6, H. S. Barber; Lakeland, Md., June 25, 1906, D. H. Clemons.

M. MEGALOGASTER Snow.*—The only definite record is Dixie Landing, Va., June 1, this specimen being the type of *M. bombiformis* Townsend, by whom it was collected. A specimen labeled District of Columbia, but with no date nor name of collector, is in the collection of the U. S. National Museum.

M. RUFICRUS Williston.—Great Falls, Va., June 25, 1915, Greene; Chain Bridge, Va., June 5, Falls Church, Va., June 14, Glencarlyn, Va., June 7, Banks; Chain Bridge, Md., June 9, 1905, D. H. Clemons; Beltsville, Md., June 18, 1916, in copula, McAtee; Bladensburg, Md., June

* See also p. 203.

13, 1916, F. R. Cole. Also flies low. All Microdon larvae so far as known occur in ant nests.

M. SCITULUS Williston.—Beltsville, Md., July 6, Banks, F. R. Cole, Greene; July 9, McAtee; July 14, abundant, pairing, F. R. Cole, Shannon, H. L. Viereck; July 30, in copula; August 6, McAtee; all dates 1916. This species found among vegetation bordering open spots in sphagnum bogs. The whole series differs in the color of the metallic reflections from the purplish blue Florida specimens; in our form the males have chiefly fiery coppery reflections and the females greenish. It deserves a varietal if not a subspecific name.

Mixogaster Macquart.

M. BREVIVENTRIS Kahl.—Glencarlyn, Va., July 2 and 11, Banks; July 25, 1906, D. H. Clemons; Falls Church, Va., July 25, Banks. Rests on herbage in partial shade. Both localities where *Mixogaster* was collected contain *Bittacus* and *Panorpa virginica;* the two records for Glencarlyn are seven years apart.

Callicera Meigen.

C. JOHNSONI Hunter.—Falls Church, Va., April 22, 1914, Greene; flies very close to ground.

Chrysotoxum Meigen.

C. PUBESCENS Loew.—Not common but has been taken in numerous localities from April 24 to September 26, rarely however in June, July or August. Always found in bright sunlight, frequently resting on low foliage or near the base of trees. *Chrysotoxum ventricosum* Loew (Centuria quinta, p. 44), in connection with the original description, was recorded from Washington. This was misinterpreted by Osten Sacken and Williston to mean Washington City, while in reality Washington State was intended as shown by the locality labels "W. T." on the type specimens. (See Johnson, 1907, p. 77.)

Chrysogaster Meigen.

C. GREENEI Shannon.*—Great Falls, Va., on flowers of *Amelanchier* and of *Salix sericea*, April 20, 1916, McAtee; Falls Church, Va., April 27, 1915, Greene; Mount Vernon, Va., on flowers of *Amelanchier*, May 7, 1916, L. O. Jackson.

C. NIGRIPES Loew.—Fairly common May 9 to July 6; is attracted to light, visits flowers of *Amelanchier*, *Salix*, *Ceanothus*, and once occurred in great abundance on chinquapin flowers at Falls Church, Va.

C. NITIDA Wiedemann.—More common than last; April 23 to October 31; in copula, July 14; on various flowers, as *Ceanothus* and wild carrot.

* For description of this species see appendix, p. 195.

Paragus Latreille.

P. ANGUSTIFRONS Loew.—Falls Church, Va., July 24, 1913, Greene; April 26, June 11, 16, 22, and July 6; Glencarlyn, Va., June 23, Banks; Virginia near Plummers Id., Md., June 18, 1916, H. L. Viereck; Rock Creek, Md., June 15, 1913, Shannon; Maryland near Plummers Id., June 2, 1916, McAtee; Beltsville, Md., July 4 and 9, 1916, McAtee.

P. BICOLOR Fabricius.—Maryland near Plummers Id., April 23, 1914, Cabin John, Md., August 18, 1914, Linnieville, Md., July 4, 1913, Rosslyn, Va., May 18, 1913, Shannon; Falls Church, Va., July 21 to August 1, 1913, Greene; June 16, July 6, August 9 and September 7; Chain Bridge, Va., June 14, Banks; Vietch, Va., July 18, 1915; Four-mile Run Valley, Va., June 11, 1916, McAtee.

P. DIMIDIATUS Loew.—Originally described from the District of Columbia (Centuria quarta, p. 63). Knowledge of this form seems not to have advanced since Williston published his Synopsis. He then said: "The structural differences given for this species may justify its separation from *P. tibialis*, but in the examination of a considerable material which I have compared with specimens of the latter from Europe I have not been able to satisfy myself of differences sufficient to justify specific separation" (p. 20).

P. TIBIALIS Fallen.—More common than the other species of the genus; April 18 to October 30. The species of *Paragus* fly close to ground in slightly moist places near or in partial shade, but occur also on flowers.

Pipiza Fallen.

P. ALBIPILOSA Williston.—Plummers Id., Md., April 23, 1914, Maryland near Plummers Id., May 8, 1914, Cabin John, Md., April 18 and 29, 1916, Shannon; April 30, 1915, A. H. Pottinger; C. & O. Canal, Seven-Locks, Md., April 27, 1915, April 30, 1916, L. O. Jackson; Great Falls, Va., April 28, 1915, Shannon; May 12, 1911, S. A. Rohwer; April 30 (one specimen, doubtfully belonging here; I do not think this can be the *P. femoralis*, Banks).

P. CALCARATA Loew.—Washington, D. C., June 13, 1916; Maryland near Plummers Id., April 28, 1914, Shannon; Great Falls, Va., April 20, 1913, F. Knab. Loew's description of this species mentions the occurrence of processes only on the hind coxae. There are processes on the middle coxae also of the two specimens from this region and of another in the National Collection from New Hampshire. The type may have these structures obscured. European dipterists assign species with similar structures and with the hypopygium conspicuously set off from the remainder of abdomen to the genus *Cnemodon*. All the characters used, however, are secondary sexual ones, hardly suitable for the separation of genera. The females are in no way peculiar.

P. FEMORALIS Loew.—Dead Run, Va., May 9 and 19, 1916, May 23, 1915, Shannon; Great Falls, Va., May 2, 1916; Plummers Id., Md., May 10, 1916, McAtee.

P. FESTIVA Meigen.—Falls Church, Va., May 24, Great Falls, Va., June 21, Banks; May 2, 1916, McAtee; Dead Run, Va., May 9 and 19, 1916, Shannon; June 28, Banks; Rosslyn, Va., May 11, 1913, Shannon; Plummers Id., Md., April 21, 1907, May 10, 1916, on flowers of buttercup, McAtee; Maryland near Plummers Id., May 8, 1915, J. C. Crawford; Cabin John, Md., April 29, 1916, Shannon.

P. NIGRIPILOSA Williston.—Cabin John Bridge, Md., April 28, 1912, F. Knab and J. R. Malloch; Dead Run, Va., April 24, 1915, Shannon; Falls Church, Va., September 5, Banks; Virginia near Plummers Id., Md., June 2, 1916, McAtee; June 4, 1916, H. L. Viereck; Plummers Id., Md., May 10, 1916, McAtee.

P. PISTICA Williston.—Great Falls, Va., August 11, 1915, McAtee; Plummers Id., Md., April 28, 1914, April 29, 1916, Shannon; May 10, 1914, J. C. Crawford, on flowers *Sedum ternatum;* May 19, 1914, at light, Maryland near Plummers Id., August 29, 1915, Dead Run, Va., May 21, 1916, June 19 and August 29, 1915, Shannon; Glencarlyn, Va., June 7 and 30, Banks. The last-named specimens are females; males taken at Falls Church, Va., August 23 agree with *P. pubescens* Loew and *P. pistica* may be this species. *P. radicum* Walsh is an older name, but *P. modesta* Loew is doubtless the same and still older.

P. PISTICOIDES Williston.—Chain Bridge, Va., May 23 and 28, Great Falls, Va., April 27 and 30, May 25, and June 12, Banks; September 25, 1913, Shannon; Falls Church, Va., September 1, Banks; Beltsville, Md., April 30, 1916, McAtee.

P. PULCHELLA Williston.—Falls Church, Va., May 3, 10, and 23, June 14, and August 17; Great Falls, Va., May 25, Banks (these are all females; two males from Falls Church, in May, agree with *P. nigribarba* Loew, which I think is the same species, Banks); Bladensburg, Md., June 23, 1916, Shannon.

Chilosia* Meigen.

C. CAPILLATA Loew.—Originally described from the District of Columbia. Anacostia, D. C., May 4, 1913, P. R. Myers; Plummers Id., Md., April 16, 1915, swarming above small tree tops, Shannon; Maryland near Plummers Id., April 16, 1916, H. L. Viereck; Dead Run, Va., April 18, 1915, Shannon; Great Falls, Va., April 20, 1916; Mount Vernon, Va., April 18, 1916, McAtee.

C. CYANESCENS Loew.—Cabin John Run, Md., June 29, 1916, F. R. Cole.

C. PALLIPES Loew.—Originally described from the District of Columbia. Plummers Id., Md., June 15, 1915, Shannon; Dead Run, Va., July 25, 1915, Shannon; August 19, 1916, H. L. Viereck; Virginia near Plum-

* For a key to local species of *Chilosia*, synonymy of *C. tristis*, and description of *C. similis*, see Appendix, pp. 196-198.

mers Id., Md., flowers of *Aruncus*, June 2, 1916, McAtee; June 4, 1916, H. L. Viereck; Falls Church, Va., May 30, June 7, 11, and 23, on *Ceanothus*, and November 6; Glencarlyn, Va., May 30, on flowers of chinquapin, Banks.

C. PRIMOVERIS Shannon.—This species described from Plummers Id., Md., by one of the authors of this list is abundant in early spring, March 27 to April 27, on flowers of bloodroot, violets, spring beauty and *Dentaria*.

C. SIMILIS Shannon.—Cabin John, Md., October 30, 1915, Shannon; Virginia near Plummers Id., September 29, 1915, McAtee; Dead Run, Va., October 28, 1915, Shannon; Spring Hill, Va., September 29, 1911, F. Knab; Difficult Run, Va., September 8, 1914, Shannon; Great Falls, Va., October 3 and 21, Banks; October 3, 1915, McAtee; Glencarlyn, Va., October 4, on *Solidago;* males taken on this date with the females are very dark-winged, Banks.

Chalcomyia Williston.

C. AEREA Loew.—Dead Run, Va., May 9, 1916, Shannon; Falls Church, Va., April 25, on bark of stumps, Banks; May 1, 1913, W. Middleton; May 7, 1915; Great Falls, Va., April 19, 1915, Greene; April 28, 1915, on dead sycamore log, Shannon; Cabin John, Md., April 28, 1915, F. Knab and J. R. Malloch.

Myiolepta Newman.

M. NIGRA Loew.*—Falls Church, Va., May 22, 1915, in pocket† at base of tulip tree, Greene; May 30, Banks; Great Falls, Va., June 21, Glencarlyn, Va., May 30, Banks; Cabin John, Md., May 15, 1904, F. Knab; Beltsville, Md., June 14, 1914, McAtee.

M. STRIGILATA Loew.—Falls Church, Va., April 27 to May 1, 1915, sometimes at base of trees, also on blossoms of *Viburnum*, Greene; May 7 on *Viburnum*, Banks; Mt. Vernon, Va., on flowers of *Amelanchier*, May 7, 1916, L. O. Jackson; Maryland near Plummers Id., May 14, 1915 (var.), Shannon; April 20, 1916, on flowers of *Prunus americanus*, L. O. Jackson; Beltsville, Md., on apple blossoms, April 30, 1916, McAtee.

M. VARIPES Loew.—Washington, D. C., April 26, F. R. Cole; May 4, 1913, May 12, 1914, F. Knab; May 22, W. R. Walton, May 22, 1908, H. O. Marsh; May 25, 1912, McAtee; Bethesda, Md., April 27, 1915, R. H. Hutchinson; Falls Church, Va., April 27, 1915, May 3, 1913, Greene; May 7, 21, and 26, June 28; Chain Bridge, Va., May 21, Banks; Dead Run, Va., May 21, 1916, Shannon. Captured about bases of trees and on flowers of *Viburnum;* larvae in pocket in tulip tree, Greene.

* For synonymy of *Xylota tuberans* see Appendix, pp. 198-199.

† The term pocket as used in this paper means a hollow place or blind hole either in the side or in a crotch of a tree. Such pockets are always filled with dead leaves or other decaying vegetable matter, and keep quite moist from rain water or sap from the tree.

Baccha Fabricius.

B. COGNATA Loew.—Dead Run, Va., June 22, 1915, in shady woods, Shannon.

B. CLAVATA Fabricius.—Falls Church, Va., June 16, Banks; District of Columbia, July, 1902.

B. FASCIPENNIS Wiedemann.—Falls Church, Va., September 4, 1915, Greene; August 22, Great Falls, Md., July 21, 1916, Banks; Bladensburg, Md., September 23, 1915, in open woods, Shannon; Plummers Id., Md., June 28, 1905, July 27, 1907, Fisher; Anacostia, D. C., July 26, 1914, W. D. Appel.

B. FUSCIPENNIS Say.—Everywhere May 28 to October 11. Most of the Bacchas are found hovering near flowers or near tips of branches, frequently of pine trees. *Ocyptamus longiventris* Loew (Centuria septima, p. 66), described from the District of Columbia is considered a synonym.

B. LUGENS Loew.—Great Falls, Va., July 17 and 31, Glencarlyn, Va., October 10, Banks; Plummers Id., Md., July 14, 1913, and August 6, 1915, Maryland near Plummers Id., August 5, 1913, Shannon; Cabin John, Md., July 12, F. Knab.

B. TARCHETICUS Walker.—Odenton, Md., July 18, Banks; Beltsville, Md., July 30 and August 6, 1916, McAtee; Hyattsville, Md., August 4, F. Knab; Plummers Id., Md., July 28, 1907, A. K. Fisher; August 11 and 24, 1907, McAtee; August 25, 1907, A. K. Fisher; September 1, 1907, McAtee; Virginia near Plummers Id., Md., June 19, 1909, McAtee; Dixie Landing, Va., August 19, C. H. T. Townsend; Pimmit Run, Va., August 1, 1908, F. Knab; Falls Church, Va., July 25, 1913, September 11, 1912, Greene; September 17; Great Falls, Va., July 23 and 31, Banks; Washington, D. C., July 5, 1909, A. K. Fisher. Bred from Aphid colony, Greene.

Platychirus St. Fargeau and Serville.

P. CHAETOPODIUS Williston.—Rosslyn, Va., August 25, 1912, F. Knab and J. R. Malloch; Chain Bridge, Va., May 28 and September 17, Banks; Maryland near Plummers Id., July 30, 1914, Shannon. The species of this genus occur on flowers sometimes in marshy places.

P. HYPERBOREUS Staeger.—Almost if not quite as common in its season as *P. quadratus*, and similar in habits; April 20 to August 6.

P. QUADRATUS Say.—Common; April 6 to November 5; on many kinds of flowers.

Melanostoma Schiner.

M. MELLINUM Linnaeus.—About as common as *M. obscurum*, but the various records are given. Beltsville, Md., June 18, 1916, McAtee; Maryland near Plummers Id., April 23, 1914; May 7, 1913, Shannon; April 23, 30, June 18, 1916, L. O. Jackson; May 10, 1916, McAtee; May

28, 1916, H. L. Viereck; Cabin John, Md., June 14, 1913; Great Falls, Va., April 20, 1913; April 22, 1915, Shannon, April 20, 1913, F. Knab; May 2, 1916, McAtee; Washington, D. C., April 30, 1915, G. E. Quinter; Rosslyn, Va., May 1, 1913, Shannon; Falls Church, Va., April 28, 1913, Greene; June 16 and July 7, Banks; Four-mile Run, Va., April 25, 1915.

M. OBSCURUM Say.—Very common; on many kinds of flowers; April 10 to October 26.

Didea Macquart.

D. FASCIATA Macquart.—Plummers Id., Md., June 11 and 20, 1912; June 1, 1913, in wasp's burrow, H. S. Barber; October 7, 1906, A. K. Fisher; Washington, D. C., June 6, 1912, McAtee; Chain Bridge, D. C., September 15, 1912, F. Knab and J. R. Malloch; Hyattsville, Md., May 13, 1913, A. Busck; Lanham, Md., May 3, 1915, F. H. Loomis; Somerset Heights, Md., July 11, 1903, E. S. G. Titus; Washington, D. C., September 20; Falls Church, Va., July; Banks; Veitch, Va., September 23, 1913, Greene. Generally on foliage in sunny places; larvae attack aphids.

Syrphus Fabricius.

S. AMERICANUS Wiedemann.—Everywhere, occurring continuously throughout the season; extreme dates are April 8 to November 2.

S. ARCUATUS Fallen.—Falls Church, Va., April 22, and May 26 to 30, 1913, Greene; May 4 and 25, Banks; Great Falls, Va., April 19, 1915, Greene; Glencarlyn, Va., June 14, Banks; Washington, D. C., May 16, 1913; May 29, 1913; College Park, Md., May 25, 1913, F. Knab; Beltsville, Md., May 2, 1915, L. O. Jackson; Hyattsville, Md., July 9, 1909, pupa collected on leaf, fly emerged later, McAtee; Plummers Id., Md., October 7, 1906, A. K. Fisher; Maryland near Plummers Id., April 15, 1915, McAtee. Usually near pine trees, as also *S. perplexus;* larva feeds on aphids on pine twigs.

S. FISHERI Walton.—Glencarlyn, Va., July 14, Banks.

S. KNABI Shannon.*—Falls Church, Va., June 22, 1912, Greene; June 21, 1914, F. Knab; July 4, August 30 and September 13, Banks; Glencarlyn, Va., June 24, Great Falls, Va., June 25, Dead Run, Va., June 23, Banks; August 3, 1915, Difficult Run, Va., July 7, 1915, Shannon; Virginia near Plummers Id., Md., April 28, 1907, Beltsville, Md., June 18, 1916, McAtee; Lanham, Md., May 3, 1915, F. H. Loomis; Plummers Id., Md., June 7 and 28, 1914, June 14, 1908, McAtee; June 1, 1913, stored by wasp in its burrow in a log, June 20, 1912, June 30, August 6, H. S. Barber; June 19 and 30, July 19, August 6, Shannon; August 11 and 24, 1907, A. K. Fisher; September 5, 1915, McAtee; Maryland near Plummers Id., June 18, 1916, L. O. Jackson; Cabin John Bridge, Md., July 29, 1916, McAtee; Washington, D. C., September 30,

* For a key to the section of *Syrphus* containing this species and descriptions of *S. knabi, S. ribesii vittafrons* and notes on *S. rectus,* see Appendix, pp. 199-202.

1906, McAtee. Common; season April 28 to September 30; hovers over flowers and in sunny spots.

S. PERPLEXUS Osburn.—Plummers Id., Md., April 4, 1915; April 16, 1915, May 7, 1916, Shannon; Great Falls, Va., April 28, 1915, Greene; Falls Church, Va., April 26, October 6; Great Falls, Va., April 15, Banks.

S. RECTUS O. S.—Washington, D. C., no date, D. H. Clemons; Bladensburg, Md., September 23, 1915; Rosslyn, Va., April 23, 1913; Falls Church, Va., April 22, 1913, Shannon; Plummers Id., June 4, 1915; May 8, 1915; June 22, 1903, E. A. Schwarz; September 29, 1912, P. R. Myers; Dead Run, Va., June 22 and 29, 1915; October 28, 1915; Cupids Bower Id., Md., May 30, 1915; Great Falls, Va., April 28, 1915, Shannon; September 12 and 28, Banks; Beltsville, Md., June 14, 1914, McAtee; Plummers Id., Md., August 4, 1907, A. K. Fisher; Virginia near Plummers Id., Md., April 23, 1916, H. L. Viereck; September 29, 1915, McAtee.

S. RIBESII Linnaeus.—Marshall Hall, Md., September 17, 1908, F. H. Chittenden; Beltsville, Md., June 14, 1914, July 30, 1916, McAtee; Plummers Id., Md., April 12, 1908, A. K. Fisher; Washington, D. C., October 2, 1906, McAtee; May 17, 1916; Falls Church, Va., June 8, and 16, September 19, and October 6, Banks; August 23 to 29, 1913, Greene; Glencarlyn, Va., June 21; Great Falls, Md., July 12, Banks; Great Falls, Va., April 20, 1916, McAtee. *S. ribesii* var. *vittafrons* Shannon.—Lakeland, Md., November 11, 1909, F. Knab; Maryland near Plummers Id., April 17, 1903, W. V. Warner; April 22, 1903, H. S. Barber; Cabin John, Md., September 13, F. Knab; Great Falls, Va., September 25, 1913; April 20, 1913, Shannon; September 24, Banks; Rosslyn, Va., April 23, 1913, Shannon.

S. TORVUS Osten Sacken.—Common and widely distributed; extreme dates of collection for spring are: March 26 to June 1 and for fall September 6 to December 9. No specimens taken during the summer months.

The species of *Syrphus* are mostly not found on flowers, but hovering in air in sunny places sometimes ten or more feet above the ground. The larvae are aphid feeders.

S. XANTHOSTOMUS Williston.—Plummers Id., Md., May 23, 1911, P. R. Myers.

Xanthogramma Schiner.

X. AEQUALIS Loew.—Virginia near Plummers Id., July 20, 1912, P. R. Myers.

X. DIVISA Williston.—One from Falls Church, Va., June 2, Banks, agrees well with type, but it is hardly more than a variation of *felix*, the spots being smaller and consequently farther apart.

X. EMARGINATA Say.—Maryland near Plummers Id., August 5, 1913, Shannon; Cabin John, Md., May 15, 1904, F. Knab; Falls Church, Va., August 26, 1913, Greene; Glencarlyn, Va., June 17; Chain Bridge, Va., May 21, Banks; Great Falls, Va., October 3, Banks.

X. FELIX Loew.—Falls Church, Va., June 16, Banks.

X. FLAVIPES Loew.—Occurs everywhere and is fairly numerous; extreme dates of collection are: May 3 to October 10. Flies among herbage seldom more than a few feet above the ground.

Allograpta Osten Sacken.

A. OBLIQUA Say.—Very common; May 3 to October 26. Occurs on *Ceanothus* and other flowers; was seen swarming in large numbers in open pine growth at Dead Run, Va., June 29, 1915, Shannon. Larvae feed on aphids, Greene.

Mesogramma Loew.

M. GEMINATA Say.—Omnipresent and very abundant, April 23 to October 14.

M. MARGINATA Say.—Omnipresent and very abundant; April 4 to November 14. In copula as late as October 25. The species of *Mesogramma* occur near or on flowers and near aphid-infested plants; the larvae feed on aphids.

M. POLITA Say—Very abundant and widely distributed; June 22 to October 28. Oviposition seems sometimes to be very carelessly done, specimens observed near Little Falls, D. C., August 22, 1915, were extruding eggs wherever they alighted, on any leaf, and even on the observer's hands and clothing (McAtee).

Sphaerophoria St. Fargeau and Serville.

S. CYLINDRICA Say.—Omnipresent and very abundant; has been taken from April 6 to October 21. Often about flowers, known to visit those of *Salix humilis*, *Brassica*, *Ceanothus*, *Daucus*, and *Anthemis cotula*. In copula May 31.

S. SCRIPTA Linnaeus.—Great Falls, Va., October 21, Banks; Maryland near Plummers Id., May 28, 1914, Shannon; Cabin John, Md., May, 1915, J. C. Crawford; Chevy Chase, Md., May 9 and 13, 1915, G. E. Quinter.

Pelecocera Meigen.

P. PERGANDEI Williston.—Virginia, November 16, 1879, Theo. Pergande, the type specimens probably collected at Chain Bridge; Great Falls, Va., October 21, Banks, October 22, 1915, Greene; flying over low plants about 15 inches from the ground; has also been taken on flowers of wild mustard.

Sphegina Meigen.

S. CAMPANULATA Robertson.—Great Falls, Va., April 28, 1915; Virginia opposite Plummers Id., May 11, 1916, Greene, flying near base of tulip tree or hovering near low foliage along a stream; Dead Run, Va., May 9 and 19, 1916, Shannon. (In my opinion the *Sphegina* here recorded as *campanulata* are merely specimens of *S. rufiventris* that have not attained full color, McAtee.)

S. KEENIANA Williston.—Dead Run, Va., May 5, 1915, May 9, 1916, Shannon; June 23, Banks. Five other specimens which may be only very dark forms of *keeniana* were taken at Cabin John Bridge, Md., April 28, 1912, F. Knab and J. R. Malloch; Plummers Id., Md., May 10, 1914, Shannon; Virginia near Plummers Id., May 2, 1909, McAtee; and Dead Run, Va., June 19 and 22, 1915, Shannon.

S. LOBATA Loew.—Plummers Id., Md., May 18, 1915, Shannon; Maryland near Plummers Id., April 24, 1916, May 8, 1915, J. C. Crawford; May 28, 1916, H. L. Viereck; Great Falls, Va., April 28, 1915, Greene; April 20, 1916, McAtee; Chain Bridge, Va., June 4, Falls Church, Va., June 26, Banks; Virginia near Plummers Id., Md., June 2, 1916, McAtee; June 4, 1916, J. C. Crawford; Dead Run, Va., May 11, 19, and June 20, 1916, Shannon.

S. RUFIVENTRIS Loew.—Plummers Id., Md., May 10, 1916, McAtee; June 19, 1913, Shannon; Maryland near Plummers Id., May 8, 1915, on *Washingtonia*, J. C. Crawford; May 10, 1916, McAtee; Dead Run, Va., May 11, 1916, Shannon; Virginia near Plummers Id., June 2, 1916, McAtee; June 4, 1916, H. L. Viereck and J. C. Crawford; Falls Church, Va., June 6; Chain Bridge, Va., June 9; Great Falls, Va., May 25, Banks. Immature specimens of this species are pale yellow. *Sphegina* occur on flowers especially on those of *Aruncus*.

Neoascia Williston.

N. DISTINCTA Williston.—Rosslyn, Va., May 1, 1913, Shannon; Falls Church, Va., April 26, resting on a flower a few inches from the ground; June 4, 1916, Banks.

N. GLOBOSA Walker.—Washington, D. C., July 14, A. N. Caudell; Falls Church, Va., October 3, May 17, July 4; Great Falls, Va., June 21; Dyke, Va., May 14, Glencarlyn, Va., May 30, 1916, Banks; seen hovering around herbage about a foot from ground.

Rhingia Scopoli.

R. NASICA Say.—Common; April 27 to October 21, in damp places, often in partial shade, and at flowers of *Impatiens*, *Viola*, *Nepeta glechoma*, and *Hydrophyllum*.

Brachyopa Meigen.

B. FLAVESCENS Shannon.*—Dead Run, Va., April 9 and 24, 1916, May 23, 1915; June 9, 1915, May 19, 1916, Shannon; hovering near chestnut log on rocky hillside with northern exposure; originally described from the locality cited.

B. VACUA Osten Sacken.—Maryland near Plummers Id., April 28, 1914, on blossoms of wild cherry, wild pear, etc., Shannon; Virginia near Plummers Id., April 25, 1909, McAtee; Dead Run, Va., April 24, 1916,

* For description of female of this species see Appendix, p. 202.

Shannon; Great Falls, Va., April 30, flying near trunk of large tree, Banks; Falls Church, Va., larvae under dead tulip bark in the late fall, emerged the next spring, Greene.

Volucella Geoffroy.

V. EVECTA Walker.—Numerous records, May 25 to July 23; occurs around flowers. The variety *sanguinea* Williston also occurs (Beltsville, Md., June 11–18, W. R. Walton).

V. OBESA Fabricius.—Falls Church, Va., May 20, at *Ceanothus ;* Glencarlyn, Va., June 28, Banks.

V. VESICULOSA Fabricius.—Plummers Id., Md., June 24, 1916; remains of one in spider web in insectary, August 17, 1914, Shannon; Glencarlyn, Va., June 20, at *Ceanothus*, Banks; Clarke's Station near Rosslyn, Va., July 11, 1913, Shannon; Washington, D. C., August 19, 1911, F. Knab.

Sericomyia Meigen.

S. CHRYSOTOXOIDES Macquart.—Cabin John Run, Md., October 10, 1915, J. Silver; Virginia near Plummers Id., October 5, 1913, Shannon; Dead Run, Va., May 24, 1916, Shannon; Great Falls, Va., May 19, 1915, McAtee; April 30, Banks; Beltsville, Md., June 9, 1915, McAtee.

Eristalis Latreille.

E. AENEUS Fabricius.—Washington, D. C., September 18, 1914; October 4, 1915, Shannon; March 29, 1907; October 22, 1914, McAtee; November 14, 1914, L. O. Jackson; Dixie Landing, Va., Washington, D. C., May, July, August, November, C. H. T. Townsend; Falls Church, Va., August 2, and July, Banks.

E. ARBUSTORUM Linnaeus.—Common everywhere; taken from April 4 to October 30; in copula, July 14, occurs on a great variety of flowers.

E. BASTARDI Macquart.—Washington, D. C., May 27, C. H. T. Townsend.

E. DIMIDIATUS Wiedemann.—Fairly common, season March 16 to September 23; on various flowers as those of shadbush, willow and wild plum.

E. FLAVIPES Walker.*—Washington, D. C., April 10, 1903; received from A. A. Doolittle of the Washington High Schools.

E. SAXORUM Wiedemann.—Beltsville, Md., July 30, 1916, on flowers of *Tofieldia racemosa*, McAtee.

E. TENAX Linnaeus.—Very common; taken everywhere and in every month from March to December, inclusive; often on flowers.

E. TRANSVERSUS Wiedemann.—Common; taken from April 7 to October 26; rests on flowers, often on yellow flowers. Pupa has been found in pocket of tulip tree, Greene.

* See also p. 203.

Meromacrus Rondani.

M. CRUCIGER Wiedemann.—Dead Run, Va., July 15, 1915, Shannon; probably a stray specimen as this species has a more southern range.

Tropidia Meigen.

T. ALBISTYLUM Macquart.—Washington, D. C., May 16, 1916, McAtee; June 19, 1915; Marlboro, Md., June 19, 1915, Shannon; Falls Church, Va., June 19, 1914; June 26 and 29, 1912; August 3, 1914, Greene; May 5 and 24, July 10, October 21, Banks. Not on flowers but resting on leaves or hovering a foot or more from ground in sunny places.

T. QUADRATA Say.—Washington, D. C., August 19, 1911, F. Knab.

Helophilus Meigen.

H. CHRYSOSTOMUS Wiedemann.—Common in its chosen habitat along streams and in marshes; May 3 to August 3.

H. DISTINCTUS Williston.—Common in same situations as last species; the two often taken at same time; May 21 to August 3.

H. DIVISUS Loew.—Originally described from the District of Columbia (Centuria quarta, p. 78). It seems by no means certain that this species and *H. laetus*, recorded below, are really distinct. The latter name has page priority.

H. LAETUS Loew.—Plummers Id., Md., on flowers of *Cornus stricta*, June 11, 1916, H. L. Viereck.

H. LUNULATUS Meigen?—Maryland near Plummers Id., April 23, 1914, Shannon.

H. SIMILIS Macquart.—Common; season April 12 to October 30; usually near water where it basks in sunshine; has also been taken at flowers of *Salix* and *Potentilla monspeliensis*.

Mallota Meigen.

M. CIMBICIFORMIS Fallen.—Piney Branch, D. C., no date, D. H. Clemons; Washington, D. C., May 10, 1911, McAtee; May 17, C. L. Marlatt; June 18, 1908, F. H. Chittenden, July 8, 1913, J. D. Hood; Arlington, Va., July 10, Wm. Palmer; Falls Church, Va., May 7, Banks; July 23, 1913, Greene; Maryland near Plummers Id., June 26, 1902, H. S. Barber; Plummers Id., Md., May 18, 1912, A. K. Fisher. Larvae have been found in pocket in tulip tree, Greene.

M. POSTICATA Fabricius.—Bladensburg, Md., June 7, 1916, L. O. Jackson; Plummers Id., Md., June 14, 1908, McAtee; Maryland near Plummers Id., May 21, 1916, J. C. Crawford; May 28, 1916, L. O. Jackson, H. L. Viereck; Virginia near Plummers Id., May 21 and 28, 1916, H. L. Viereck; June 2, 1916, June 19, 1909, McAtee; Dead Run, Va., May 23 and 25, 1915, May 24, 1916, Shannon; Rosslyn, Va., July 7, F. Knab;

Glencarlyn, Va., May 7 to 18, 1913, Greene; May 9, Banks; Falls Church, Va., May 26, 1913, May 31, 1914, Greene; May 25 and June 30, Banks; Mt. Vernon, Va., June 4, 1916, McAtee. The larvae of the rat-tail type have been found in pockets in living chestnut tree, Greene.

Merodon Meigen.

M. EQUESTRIS Fabricius.—This species frequently has been bred from material held up for inspection in the greenhouses and insectary of the Department of Agriculture. One specimen however is labeled simply, Washington, D. C., August 4, 1907. The lack of indication that it is a bred specimen makes it probable that the specimen was captured in the free state. Moreover, the records of the Bureau of Entomology do not show that any flies of this species were bred at any date near that given.

Teuchocnemis Osten Sacken.

T. BACUNTIUS Walker.—Great Falls, Va., April 28, 1915, Greene; April 30, rests on dead leaves in moist spots in woodland, Banks; Dead Run, Va., May 19, 1916, Shannon; Beltsville, Md., May 8, 1916, C. H. T. Townsend.

T. LITURATUS Loew.—Plummers Id., Md., April 14, 1906; April 10 and 14, 1910, A. K. Fisher; Falls Church, Va., April 25, 1913, Greene; May 1; Great Falls, Va., April 30, Banks. Sometimes rests on oak bark.

Pterallastes Loew.

P. THORACICUS Loew.—Plummers Id., Md., June 30, 1907, A. K. Fisher; Virginia opposite Plummers Id., September, 1909, J. C. Crawford; Offuts Id., Md., September 8, 1914, Shannon; Falls Church, Va., August 30, 1912; August 19, 1913, Greene; July 13, 1913, F. Knab; June 14, July 24, and September 7, Banks; Great Falls, Va., October 3, 1915, McAtee; Glencarlyn, Va., June 14, October 4; Beltsville, Md., June 9, Banks; July 4, 1916, McAtee. Rests on foliage near ground in sunny places.

Syritta St. Fargeau and Serville.

S. PIPIENS Linnaeus.—Everywhere, April 14 to October 26; in copula, July 9; often about or on flowers.

Xylota Meigen.

X. ANGUSTIVENTRIS Loew.—Beltsville, Md., May 28, 1916, McAtee; July 6, 1916, F. R. Cole; Plummers Id., Md., May 23, 1914; Maryland opposite Plummers Id., July 25, 1914, Shannon; Virginia near Plummers Id., Md., June 18, 1916, H. L. Viereck; Dead Run, Va., July 18 and 25, 1916, Shannon; Four Mile Run, Va., May 30, 1910, F. Knab; Glencarlyn, Va., June 5; Falls Church, Va., June 14, July 17, and 24; Great Falls, Va., May 25 and July 21, Banks. This species and *X. elongata* sometimes rest on the inner leaves of bushes, where it is extremely difficult to get them.

X. ANTHREAS Walker.—Beltsville, Md., July 30, 1916, flowers of *Ceph-*

alanthus; Plummers Id., Md., June 14, 1908, McAtee; Great Falls, Va., June 5, Banks; Four-Mile Run, Valley, Va., June 11, 1916, on *Ceanothus*, McAtee.

X. BICOLOR Loew.—Beltsville, Md., July 6, 1916, F. R. Cole; August 6, 1916, McAtee; Marlboro, Md., June 19, 1915, Shannon; Cabin John, Md., May 23, 1911, P. R. Myers; Maryland opposite Plummers Id., June 13, 1914; Plummers Id., Md., June 20, 1916, Shannon; Dead Run, Va., June 9, 1915; Great Falls, Va., June 1, 1915, Shannon; Great Falls, Va., June 25; Chain Bridge, Va., June 5, June 23, 1916; Glencarlyn, Va., May 31, June 16, Banks.

X. CHALYBEA Wiedemann.—Plummers Id., Md., May 8, 1915; June 4, 1915; June 13, 1915; June 17, 1913, J. D. Hood; July 16, 1916, H. L. Viereck; July 25, 1916, A. K. Fisher; July 28, 1912, McAtee; Maryland near Plummers Id., May 24, 1916, J. C. Crawford; College Park, Md., May 25, 1913; Dead Run, Va., May 23, 1915; May 24, 1916; June 9, 1915; Linneville, Md., July 5, 1913, Shannon; Falls Church, Va., June 21, 1914, F. Knab; Great Falls, Va., June 27, 1913, Greene; May 19, June 25, and July 21, Banks; Glencarlyn, Va., May 9, Banks; Washington, D. C., May 22, C. H. T. Townsend; rests on leaves in bright sunshine several feet from ground, also on moist logs in sunshine.

X. ELONGATA Williston.—Glencarlyn, Va., June 17, and July 2, Banks; Beltsville, Md., July 6, 1916, F. R. Cole.

X. EJUNCIDA Say.—Dyke, Va., May 14, F. R. Cole; Rosslyn, Va., July 11, 1913; Linneville, Md., July 5, 1913, Shannon; College Park, Md., May 25, 1913, F. Knab; Beltsville, Md., June 18, July 4, and August 6, 1916; Plummers Id., Md., June 14, 1908; July 11, 1909, McAtee; July 24, Banks; Dead Run, Va., June 9, 1915; June 29, 1915, Shannon; Falls Church, Va., May 23, June 2, 18, 23, 28; Odenton, Md., July 18; Glencarlyn, Va., June 16 and July 2; Great Falls, Va., July 21; Banks; rests on leaves.

X. FACIALIS Coquillett.—Beltsville, Md., June 25, 1915, Shannon.

X. FRAUDULOSA Loew.—Glen Echo and Cabin John, Md., April 23, 1914; Dead Run, Va., April 21 and May 9, 1916; April 21 and August 3, 1915; Rosslyn, Va., April 23, 1913, Shannon; Great Falls, Va., April 20, 1916, flowers of *Amelanchier*, McAtee; Marlboro, Md., June 19, 1915, Shannon; Beltsville, Md., July 30, 1916, flowers of *Cephalanthus*, McAtee.

X. MARGINALIS Williston.—Maryland opposite Plummers Id., May 14, 1915, on pine log; Great Falls, Va., April 15, Banks; April 28, 1915, on dead sycamore log, Shannon.

X. METALLICA Wiedemann.—Falls Church, Va., June 7, Banks. In general similar to *X. ejuncida*, but the pale femora will readily separate it.

X. PIGRA Fabricius.—Washington, D. C., May 22, C. H. T. Townsend; Falls Church, Va., July 5 and May 23. Larvae have been found under dead pine bark (Greene).

X. SUBFASCIATA Loew.—Washington, D. C., April 15, 1910, A. Busck; Bladensburg, Md., September 23, 1915; Dead Run, Va., May 23 and 27, 1915; June 19, 1915; March 13, 1915, April 3, 1915, on maple log, Shannon; Falls Church, Va., June 28; Glencarlyn, Va., June 16, Banks. Very close to *X. ejuncida*, but differs in shape of abdominal marks, in the color of arista, and of the front.

Chrysochlamys Rondani.

C. DIVES Osten Sacken.—Plummers Id., Md., August 11, 1912, McAtee; June 19, 1913, Shannon; Veitch, Va., June 14, 1912, at sap on trunk of chestnut, Greene; Falls Church, Va., July 18, Banks. Very possibly this may prove to be the *C. buccata* Loew.

Brachypalpus Macquart.*

B. FRONTOSUS Loew.—Originally described from the District of Columbia; Plummers Id., Md., April 14, 1914; Shannon; April 20, 1916, H. L. Viereck; Dead Run, Va., April 11 and 18, 1915, Shannon; Cabin John Bridge, Md., April 28, 1912, F. Knab; Vienna, Va., April 14, 1915, on *Benzoin aestivale*, J. C. Crawford; April 11 and 14, 1915, on willow, R. A. Cushman; Falls Church, Va., April 3, 1913; April 25, 1913, and April 11 to 25, 1914, Greene; April 12 and 18; Great Falls, Va., April 15, Banks. Adults rest on tree trunks; a female was seen to deposit eggs on water, in pocket of living chestnut, Greene.

B. RILEYI Williston.—Great Falls, Va., April 20, 1916, McAtee; Dead Run, Va., March 1 and 2; April 4, 1915, on rotten log in swamp; March 21 and 24, 1916, April 11 and 24, 1915, common, resting on an oak log lying in small sphagnum swamp, Shannon. Pupae have been found in frass in an insect gallery in cedar, Greene.

Merapioidus Bigot.

M. VILLOSUS Bigot.—Dead Run, Va., March 13 and 14, 1915, at sap of sugar maple, March 24, 1916, Shannon; March 18, 1915, at sap on beech trunk and on sugar maple, Greene; Plummers Id., Md., March 14, 1915, on red maple flowers, McAtee; Falls Church, Va., March 14, on fresh cut maple stump, also on maple flowers and resting on beech trunk, Banks.

Criorhina Hoffmannsegge.

C. VERBOSA Harris.—Falls Church, Va., April 3, 1913; April 5, 1916, Greene; resting on maple blossoms.

Blera Billberg.

B. BADIA Walker.—Plummers Id., Md., June 20, 1916; Dead Run, Va., May 23, 1915, May 24, 1916, June 20, 1916, July 9 and 29, 1915, around chestnut logs and resting on leaves in partial shade, Shannon.

* For a key to the species of Brachypalpus see appendix, pp. 202–203.

B. PICTIPES Bigot.—Dead Run, Va., May 19, 1916, May 23, 1915, Shannon; Chain Bridge, Va., May 23 and 29, rests on leaves in partial shade of open woods, Banks; Beltsville, Md., April 30, 1916, flowers of *Aronia arbutifolia*, McAtee.

B. UMBRATILIS Williston.—Falls Church, Va., April 22, 1913; April 23, 1913, on flowers of *Viburnum*, Greene; Chain Bridge, Va., May 21, flying among plants about two feet from ground, Banks; Mt. Vernon, Va., May 7, 1916, flowers of *Amelanchier*, L. O. Jackson; pupae have been found in pocket in a sycamore, Greene.

Somula Macquart.

S. DECORA Macquart.—Washington, D. C., Walton; Plummers Id., Md., June 4, 1915, May 23, 1914, H. S. Barber; May 5, 1913, Shannon; Maryland near Plummers Id., May 21, 1916, H. L. Viereck; May 23 and June 9, 1915; Virginia near Plummers Id., June 2, 1916, McAtee, June 4, 1916, H. L. Viereck; Dead Run, Va., May, June and July, 1915, 1916; common in Sphagnum swamp, Shannon; Rosslyn, Va., May 11, 1913, F. Knab; Falls Church, Va., April 22 to May 29, 1913; June 6, 1913; Chain Bridge, Va., June 23, 1915, Greene; Falls Church, Va., May 25 and 30; Dyke, Va., May 14; Great Falls, Va., May 19 and 25; Chain Bridge, Va., May 28; Glencarlyn, Va., May 10, Banks. Sometimes taken at large trees which have some loose bark; also resting on leaves in sunny places. Larvae of rat-tail type have been found in pocket of living tulip tree (Greene).

Milesia Latreille.

M. VIRGINIENSIS Drury.—Common, June 4 to October 9; in copula Plummers Id., Md., August 4, 1907, A. K. Fisher. Often seen about *Ceanothus*, *Rhus* and other shrubs when in bloom, but not actually upon the flowers.

Spilomyia Meigen.

S. FUSCA Loew.—In the Osten Sacken collection at Cambridge there is a specimen labeled District of Columbia (McAtee).

S. HAMIFERA Loew.—Washington, D. C., July 1, F. C. Pratt; Beltsville, Md., on flowers of *Sambucus*, July 4, 1916, McAtee; Maryland near Plummers Id., June 20, 1916, Shannon; June 26, 1902, H. S. Barber; Dead Run, Va., June 29, 1915, Shannon; Plummers Id., Md., July 5, 1909, McAtee; Falls Church, Va., June 26, 1913, on leaves of maple in shade; also on low flowers, Greene; July 16; Great Falls, Va., June 27, July 21, 1916, in copula, Banks.

S. LONGICORNIS Loew.—Beltsville, Md., September 12, 1915, L. O. Jackson; Bladensburg, Md., September 23, 1915, Shannon; Dixie Landing, Va., October 5, C. H. T. Townsend; Falls Church, Va., July 27, 1912, Greene; June 23, September 1 and 7, July 24, August 22, September 18; Glencarlyn, Va., July 2; Great Falls, Va., June 27, September 28, and October 3, Banks. Rests often on flowers of golden rod, sometimes in partial shade.

Sphecomyia Latreille.

S. VITTATA Wiedemann.—Plummers Id., Md., May 9, 1915, specimen seen flying around bases of trees, Shannon; Maryland near Plummers Id., May 6, 1914, in copula, H. Weld; May 21, 1916, H. L. Viereck; Cabin John, Md., April 29, 1916, Shannon; Washington, D. C., April 23, 1909, F. Knab; Falls Church, Va., June 22, 1907, April 22, 1913, and May 2, 1914, on blossoms of *Viburnum*, Greene; Great Falls, Va., May 10, 1915, Mt. Vernon, Va., May 7, 1916, on flowers of *Amelanchier*, L. O. Jackson.

Temnostoma St. Fargeau and Serville.

T. BOMBYLANS Fabricius.—Beltsville, Md., May 28 and June 18, 1916, McAtee; Plummers Id., Md., June 7 and 20, H. S. Barber; June 7, 14, 15, and July 7, 1908, McAtee; Maryland near Plummers Id., May 21, 1916, H. L. Viereck; Virginia near Plummers Id., April 18, 1913, bred from hickory log, H. S. Barber; June 2, 1916, McAtee; Dead Run, Va., May 14 and June 28, issuing from rotten maple log, May 9, 24, and June 20, 1916, Shannon; Washington, D. C., D. H. Clemons; Rosslyn, Va., May 4, 1913, from rotten willow log, Shannon; May 11, 1913, under bark of willow log; Falls Church, Va., June 21, 1914, F. Knab; Glencarlyn, Va., May 18; Dead Run, Va., June 23; Falls Church, Va., May 3, Banks. This species breeds in logs generally in low damp places. It flies with its black fore tarsi extending straight out and while hovering in this position it has a great resemblance to a wasp (Shannon).

T. EXCENTRICUM Harris.—Cabin John Run, Md., June 29, 1916, F. R. Cole; Plummers Id., Md., June 4 and July 6, 1915, Shannon; June 11, 1916, H. L. Viereck; Dead Run, Va., May 23 and June 20, 1915, May 10 and 21, 1916, reared from elm log, June 20, 1916, Shannon; June 23, at rotten log in partial shade, Banks; Falls Church, Va., May 26, 1913, resting on grass at base of tulip tree, Greene. This species has habits very similar to those of *T. bombylans*. It should be pointed out that the length (6 mm.) given for this species by Williston is erroneous. In the original description (Insects Injurious to Vegetation, Ed. of 1862, p. 609) Harris gives from $\frac{6}{10}$ to $\frac{8}{10}$ inch.

T. PICTULA Williston.—Plummers Id., July 20, 1912, H. S. Barber; May 19, 1916, June 18, 1914, Shannon; Washington, D. C., May 17, 1908, H. O. Marsh.

Ceria Fabricius.

C. ABBREVIATA Loew.—Falls Church, Va., May 22, from larva on oak bark, Banks.

C. WILLISTONI Kahl.—Plummers Id., Md., May 8, 1915, J. C. Crawford; Falls Church, Va., May 18, 1913; April 27, 1915; Great Falls, Va., April 28, 1915; resting on maple trunk, on leaves of May apple, in sun; also flying close to ground, Greene; Falls Church, Va., March 27, from pupa on oak bark, Banks.

BIBLIOGRAPHY.

Banks, Nathan.

Note on Ceria willistoni Kahl. Proc. Ent. Soc. Wash. 5, No. 4, June, 1903, p. 310.

Pupa collected at Falls Church, Va., adult emerging, March 27. Known previously from Florida, Texas, and Kansas. Describes puparium.

Captures of diptera. Ent. News 18, No. 10, December, 1907, p. 450.

Notes on 8 rare species from vicinity of District of Columbia, including 2 Syrphids; *Volucella obesa*, Glencarlyn, June 28, and *Pterallastes thoracicus*, Glencarlyn, June 14.

At the Ceanothus in Virginia. Ent. News 23, No. 3, March, 1912, pp. 102–110.

Records 27 species of Syrphidæ from Falls Church and vicinity, p. 109.

Miscellaneous Notes. Proc. Ent. Soc. Wash. 17, No. 3, September, 1915.

Syrphus fisheri Walton recorded from Glencarlyn, Va., July 14.

Barber, H. S.

Notes on a wood boring Syrphid. Proc. Ent. Soc. Wash. 15, No. 4, December, 1913, pp. 151–152.

Temnostoma bombylans reared from a hickory log. The locality though not stated in the article is Virginia, near Plummers Island, Md. The structure and habits of larva are discussed and the suggestion made that *T. bombylans* is a composite species.

Johnson, C. W.

Some North American Syrphidae. Psyche 14, pp. 75–80, August, 1907.

On page 77 he explains the confusion regarding place of collection of type specimens of *Chrysotoxum ventricosum* Loew, which has been erroneously recorded from the District of Columbia.

Greene, C. T.

Capture of Callicera johnsoni Hunter. Proc. Ent. Soc. Wash. 17, No. 1, March, 1915, p. 1.

At Falls Church, Va., April 22, 1914.

Loew, H.

Diptera Americae septentrionalis indigenae. Centuria quarta. Berlin Ent. Zeitschr. 7, 1863, pp. 275–326 and in the complete work, Berlin 1872, Vol. 1, pp. 159–210, contains the original descriptions of *Paragus dimidiatus Chilosia capillata*, *C. pallipes*, and *Helophilus divisus* from the District of Columbia.

Centuria quinta, Berlin Ent. Zeitschr. 8, 1864, pp. 49–104. Complete work 1, pp. 211–261, similarly contains *Chrysotoxum ventricosum* and *Microdon coarctatus*.

Centuria septima. Berlin Ent. Zeitschr. 10, 1866, pp. 1–54. Complete work 2, pp. 61–114, contains *Ocyptamus longiventris*, and

Centuria decima. Berlin Ent. Zeitschr. 16, 1872, pp. 49–124. Complete work 2, pp. 225–288, contains the original description of *Brachypalpus frontosus* from the District of Columbia.

In all cases the District of Columbia is the sole locality given. It has been shown that the locality for *Chrysotoxum ventricosum* is the State, not the City of Washington. Of the other species *Ocyptamus longiventris* has been put in synonymy.

Osburn, R. C.

Studies on Syrphidae I—Syrphus arcuatus Fallen and a related new species. Journ. N. Y. Ent. Soc. 18, No. 1, March, 1910, pp. 53–57, Pl. 1.

Records *S. arcuatus* from the District of Columbia.

Studies in Syrphidae IV. Species of Eristalis new to America, with notes on others. Journ. N. Y. Ent. Soc. 23, No. 2, June, 1915, pp. 139–145.

Shows that *E. arbustorum*, not *E. Meigenii* as formerly supposed, is the common form about the District of Columbia, as well as in many other eastern localities.

Osten Sacken, C. R.

A list of the North American Syrphidae. Bull. Buffalo Soc. Nat. Hist. 3, Art. V, pp. 38–71, November, 1875.

Records 9 species from the District of Columbia.

Shannon, R. C.

Captures of the Syrphid fly, Merapioidus villosus Bigot. Proc. Ent. Soc. Wash. 17, No. 3, September, 1915, pp. 147–148.

At Dead Run, Va., Plummers Id., Md., and Falls Church, Va.

An eastern Chilosia with hairy eyes (Diptera, Syrphidæ). Proc. Ent. Soc. Wash. 17, No. 3. September, 1915, p. 168.

Chilosia primoveris n. sp. Type locality Plummers Id., Md., recorded also from Maryland and Virginia, near Plummers Id., and from Cabin John and Great Falls, Md.

A new eastern Brachyopa. Ins. Insc. Mens. 3, Nos. 11–12, November-December, 1915, pp. 144–145, December 31, 1915.

Brachyopa flavescens n. sp., described from Dead Run, Va., May 23 and June 9, 1915.

Townsend, C. H. Tyler.

Contributions to the Dipterology of North America—I. Syrphidæ. Trans. Am. Ent. Soc. 22, pp. 33–55. March, 1895.

Records 18 species from the vicinity of the District of Columbia. One described as new, *Microdon bombiformis*, Dixie Landing, Va., June 1, is now considered the same as *M. megalogaster* Snow.

Williston, S. W.

Eine merkwurdige neue Syrphiden—Gattung. Wiener Ent. Zeitung 3, 1884, pp. 185–186, fig.

Euceratomyia pergandei gen. et sp. nov., District of Columbia, by Theo. Pergande, November 16, 1879. Now placed in genus *Pelecocera*.

Synopsis of the North American Syrphidae. Bul. No. 31, U. S. National Museum, 1886, 335 pp. 12 pls.

Fifteen species recorded from District of Columbia and vicinity.

APPENDIX.

SYSTEMATIC AND SYNONYMIC NOTES.

By R. C. Shannon.

Chrysogaster greenei new species.

Male: Shining, dark steely blue. Face fairly prominent, very dark greenish black with a broad gentle swelling in the middle; the parts of the transverse, silvery pollinose band extending outward to the eyes from below the base of the antennae are very narrow. Wings shaded very slightly. Length 6.5 mm.; wing 5.5 mm.

Female: Body very broad; very dark greenish black. The longitudinal, median ridge down the frons rather broad. Face shining, very dark green; rather prominent; the epistoma well developed; the transverse band on each side between the eye and antennae narrowed. Mesonotum with very sparse, insignificant, whitish pile. Abdomen very broad, ovate. Wings clouded apically. Length 7.5 mm.; wing 6.5 mm.

Described from two males and two females: Falls Church, Virginia, April 27, 1915 (C. T. Greene); for records of paratypes see p. 177.

Type Cat. No. 20453, U. S. N. M. Male type; female allotype.

This species falls into "group four" in my table of species for this genus (Proc. Ent. Soc. Wash. XVIII, 1916, pp. 102, 103). The male is distinguished from the males of *nigripes* and *inflatifrons* by its shining dark steel blue color but is very close to *texana*. *Texana* has the face shining steely blue and more flattened; the band a little broader between the eyes and antennae; and its wings more clearly hyaline. The female is readily recognized by its very broad appearance. *Texana*, female, has slightly more abundant pile on the frons; the longitudinal ridge down the frons narrower; the face more bluish, less prominent; the transverse band broad and even all the way across; the mesonotum more bluish and with more abundant pile; and the wings clear hyaline.

This species is named in honor of Mr. Charles T. Greene, who has done extensive collecting and rearing in the Syrphidæ.

Key to the Local Species of **Chilosia.**

1. Eyes and face hairy. . . . . *primoveris* Shannon.
   Eyes bare, face with pile only along eye margins . . . . . *2.*
2. Scutellum without marginal bristles; body with light pile. *capillata* Loew.
   Scutellum with marginal bristles . . . . . *3.*
3. Arista long-plumose, shining steely blue species . . *cyanescens* Loew.
   Arista short-pubescent . . . . . *4.*
4. Legs mostly yellow; female with face, humeri and scutellum in part yellow . . . . . *pallipes* Loew.
   Legs mostly black, tibiae partly yellow; female with face, humeri and scutellum black . . . . . *similis* n. sp.

Chilosia pallipes Loew.

This species was described (Cent. IV, 70, 1861) from females collected in the District of Columbia. The male has never been authentically recorded from this region. The writer believes that males from the Eastern States, which have usually been called *C. tristis*, are in reality *pallipes*, as the records and material invariably show only males for *tristis* and females for *pallipes*. The difference between the sexes is considerable but the same dimorphism occurs in the sexes of true *tristis*, undoubtedly correctly associated, and described from the Red River of the North. A description of local males, which are undoubtedly *pallipes*, is here given:

Pile on ocellar triangle, dull rufous and with a few black hairs, on the frontal triangle black. Antennae small, reddish yellow; arista blackish, minutely pubescent. Face shining black, the epistoma not at all produced. Mesonotum shining metallic greenish black; humeri yellow tinged, with white pollen; the pile rather long, dull yellowish brown; lateral margins of mesonotum with long and short black bristly hairs; pleurae with whitish and luteous pile. Dorsum of scutellum with yellowish brown pile, the margin with long, slender, black bristles and downwardly directed long white pile. Legs mostly yellow; front and middle femora and hind tibiae with dark median bands, the hind femora black with yellow base and apex; tarsi yellow, the last joint blackish; first joint of hind tarsi exteriorly blackish, lighter at base and apex. Abdomen rather slender, brightly metallic bronzy black, the second segment opaque black except at the exterior angles, the third opaque black on the posterior half; pile on first segment and lateral margins of second white, rufous yellow on posterior margin of second and disk of third and fourth. Wings hyaline, longer and narrower than in the female, the last section of the fourth vein consequently longer than in that sex.

Length 9 mm.; wing 8.25 mm.

The male of *tristis* differs in having the face, the epistoma especially, more developed; the pile on the dorsum of the thorax mostly black; legs black, but the apices of femora, the bases and extreme apices of tibiae, as well as the first joint of the middle tarsi, yellowish; the third abdominal segment more extensively opaque black, only the anterior angles shining aeneous.

Chilosia similis new species.

Eyes bare; scutellum with marginal bristles; arista short pubescent; abdomen of male in part opaque, the rest shining metallic bronzy black.

Male: Ocellar and frontal triangles shining black and with black pile. Antennae small, the first two joints shining brownish black, the third ferruginous; arista about two and a half times as long as antenna, black and with rather dense pubescence, most abundant basally. Face shining black, eye margins with very fine, silvery pile; tubercle large, projecting a little beyond antennal prominence. Thorax shining black; mesonotum with short, rather stiff, black pile; post-alar calli with black bristles,

pleurae with yellowish brown pile, intermixed with black; posterior margin of scutellum with rather long black bristles and short white pile. Legs black, yellow on extreme apices of femora and bases and apices of tibiae; tarsi black, the first two joints ventrally with a cushion of very short golden pile; lower margins of hind femora with very short, black bristles which extend nearly the entire length. Abdomen shining bronzy black and opaque; second segment opaque black except at anterior angles, third segment opaque on posterior half, subshining in middle on anterior half; pile short, black on opaque parts and brownish on the shining parts. Wings smoky, stigma dark luteous. Squamae and halteres darkened. Length: 6.5–8.5 mm.; wing 5.5–7.5 mm.

Female: Frons about two-thirds the width of one eye, slightly narrower posteriorly, shining black, with short black pile posteriorly and longer and denser white pile anteriorly, along eye an incomplete margin of whitish pollen. First and second antennal joints black with very short black pubescence basally. Face broader than in the male, more deeply excavated beneath antennae. Mesonotum with very short white pile; pleurae with the pile a little longer; whitish. A few rather short, black bristles along side margins of mesonotum and posterior margin of scutellum; Legs as in the male, except that the first tarsal joint of hind leg is somewhat swollen. Abdomen shining black with a greyish reflection; third and fourth segments each with an inwardly arcuate stripe of whitish pile on their disks, behind these stripes the segments are a deeper black, the third with an indication of a posterior opaque band; pile along sides of abdomen whitish. Wings slightly smoky, sometimes hyaline. Squamae white; halteres yellowish white. Length: 6–7.5 mm.; wing 5.5–6.5 mm.

Described from twenty-two specimens.

Type Cat. No. 20315 U. S. N. M.

Male type; Cabin John, Maryland, October 30, 1915 (Shannon); allotype, female, Dead Run, Fairfax Co., Virginia, October 28, 1915 (Shannon); for other local records, see list of species, p. 180. All other specimens recorded there and the following are paratypes: Riverton, New Jersey, September 7 and 20, 1904 and 1908 (C. T. Greene); Manumuskin, New Jersey, October 8, 1901 (V. A. E. Daecke); Clementon, New Jersey, October 4, 1904 (collector unknown). Usually taken on *Solidago.*

This species belongs to the group which is characterized by bare eyes, short pubescence on the arista and marginal bristles on the scutellum. The other females of this group, *pallipes*, *tristis*, and *leucoparea*, are further characterized by having a yellow spot on each side of the face and the humeri and the scutellum partly yellow, but *similis* is black in both sexes. *C. similis* male is less distinct, but may be distinguished from *pallipes* male by its dark legs and shorter pubescence and from *tristis* by having the pile on the dorsum of the thorax entirely black; pile on abdomen rather short, the squamae darkened and the ciliae deep blackish brown. *C. tristis* has the pubescence on arista and body rather

long, the pile on the mesonotum in part luteous and the squamae whitish.

Specimens of this species were sent to the late Mr. Coquillett at the National Museum by Mr. C. T. Greene for determination. Coquillett gave it only the manuscript name *Chilosia similis* which was published in the last edition of the List of New Jersey Insects, 1909. This name is retained for the species.

Its late occurrence in the year, September and October, along with occasional specimens of *C. pallipes*, is a characteristic worth noting, as in the eastern United States most of the species occur in the spring.

Note on **Myiolepta.**

Xylota tuberans was described by Williston in his Synopsis of the Syrphidæ* from a single male specimen from Texas. He states that the species can not properly be placed in the genus *Xylota*, as it differs in the position of the discal cross vein, the profile of the face, etc. A careful comparison of this specimen with species of the genus *Myiolepta* shows that it belongs to this genus, and, moreover, is conspecific with *M. nigra* Loew. It is curious that Williston, after noting the essential characters, failed to recognize his *Xylota tuberans* as a true *Myiolepta*.

In *Myiolepta* the discal cross-vein is placed before the middle of the discal cell and is rectangular; the first posterior cell is closed at the margin of the wing and the second vein turns abruptly upwards near its tip. The male has a tuberculate face and short, rather thick pile on the frons. All the femora are somewhat swollen at least and spinose beneath. *M. bella* differs in having the frons bare in the male, the second vein turned upwards less abruptly and a sawtooth like projection on the hind femora below.

In *Xylota* the cross-vein joins the discal cell beyond the middle and is oblique, the first posterior cell is closed some distance before the wing margin and the second vein turns upwards less obliquely. The frons in the males is bare, except in some species (*chalybea*, for example) there is very fine pale pile along the eyes. The face has no trace of a tubercle in either sex and the femora of the front and middle legs are not swollen nor spinose beneath.

Xylota tuberans possesses the characteristics noted under the genus *Myiolepta*. Comparison of the type with Williston's description of *M. nigra* female, and Hine's description† of *M. nigra* male, and a male specimen collected in this vicinity by Mr. Knab, proves it to be this species. Other characters which may be noted for the species are as follows: The costa at the base is white with whitish vestiture, the origin of the second and third veins bears very small, black bristles which continue for a short distance along the third vein; middle and hind legs have the first three tarsal joints whitish.

The genus *Myiolepta* has a closer relationship with *Tropidia* than with

* Bull. 30, U. S. N. M., pp. 225–226. 1886.

† Ohio Nat. XIV, p. 207. 1913.

Xylota. In fact *Myiolepta bella* seems to be a connecting link between these two genera; in this species the hind femora below at the apex are produced into a saw-tooth process, which is as fully developed in the male as in some species of *Tropidia;* the frons is bare as in *Tropidia*. However, there can be no doubt as to the generic affinity of *M. bella* because of the position of the discal cross-vein and the tubercle on the face of the male. On the other hand *Myiolepta* seems to be more naturally placed near *Brachyopa*, as the position of the discal cross-vein would indicate, and some species of *Brachyopa* in common with *Myiolepta* have all the femora distinctly swollen and serrated beneath.

Genus **Syrphus.**

Verrall* in his treatment of the British species of *Syrphus* points out that three species—*ribesii*, *vitripennis*, and *torvus*—form a group by themselves, being the only ones "which have the disc of the thoracal squamae hairy." Besides *ribesii* and *torvus*, there are the following species in this country possessing this curious character: *rectus* O. S. (hitherto confused with *ribesii*), *knabi* n. sp., *opinator* O. S., and possibly also *protritus* O. S. (cf. Osten Sacken, West. Dipt., p. 327, 1877), of which the writer has seen no specimens.

Syrphus grossulariae and *xanthostomus* have been confused with the above species, all of which have bicolored antennae; *grossulariae* can be recognized by the entirely black antennae and the black fringes of hairs on the middle and hind coxae, while *xanthostomus* has the antennae entirely yellow, the pile on the scutellum yellow and all the coxae, trochanters and legs yellow.

Specimens of *grossulariae* in the National Collection are from localities extending from Maine to Pennsylvania, and Metcalf† records this species from Ohio, but we have also one specimen from Kaslo, B. C., and one from Laggan, Alberta. *Grossulariae* is therefore apparently a northerly ranging species. Of *S. xanthostomus*, which appears to be rare, the National Collection has besides the type and allotype from Pennsylvania, a specimen from Plummers Island, Md., May 23, 1911 (P. R. Myers), and Mr. Banks has shown me a specimen taken by him in the Black Mountains of North Carolina, in May.

The species of this group with the disk of the squamae hairy may be tabulated as follows:

1. Eyes hairy; hind femora of female dark to beyond middle; first abdominal segment entirely dark . . . . . *torvus* O. S.
   Eyes bare; bases of femora yellow in female; sides of first abdominal segment yellow . . . . . 2.
2. Sides of mesonotum bright yellow; legs of both sexes bright yellow except for a dark band on hind femora just beyond middle . . . . . *knabi* n. sp.
   Sides of mesonotum but little paler or concolorous with dorsum; bases of femora dark in males . . . . . 3.

* Brit. Flies, VIII, p. 368, 1901.

† Bull. No. 31, Ohio State Univ., p. 86, 1913.

3. Yellow bands on third and fourth abdominal segments extending over the sides . . . . . 4.
   Yellow bands not reaching the side margins . . . . . *opinator* O. S.
4. The pile on scutellum rather sparse; female with dark rings on hind femora just beyond middle; rather small species . *rectus* O. S.
   Pile on scutellum rather dense; female without infuscate rings on hind femora; larger species . . . . . 5.
5. No dark median vitta on face . . . . . *ribesii* Linne.
   With dark median vitta on face . . . . . *ribesii vittafrons* n. var.

Syrphus knabi new species.

Squamae with rather long, light yellow pile; ground color of the sides of thorax bright yellow, with yellow pile; bands on the third and fourth abdominal segments entire and extending over the margins almost in their full width.

Male: Frons yellow with bluish green reflection, a black spot above each antenna, and with fine rather long, black hairs which continue a short distance down between the antennae and eyes. First two antennal joints reddish brown, the third joint darker, reddish beneath and somewhat pointed apically; arista brownish, a little longer than antenna. Face and cheeks yellow and with light pile. Mesonotum greenish aeneous with two obvious median stripes and bright yellow sides clothed with light golden pile; pleurae a somewhat lighter yellow than the lateral stripes of dorsum, and with golden pile; scutellum yellow with a greenish sheen and with black pile, the sides with yellow pile. Band on the second abdominal segment interrupted and outwardly produced forward where it extends over the sides and up onto the sides of the first segment. The bands on the third and fourth segments run straight across, extending over the sides in almost their full width. Fore coxae and trochanters cinereous, the hind trochanters yellowish, front and middle legs entirely yellow; hind pair yellow, the femora with dark band beyond the middle, yellow posteriorly; hind tibiae darkened on outer side of apical half and clothed with black pile; last four tarsal joints darkened. Length about 11.5 mm.; wing about 11 mm.

Female: Width of frons at vertex about equal to length of third antennal joint, but widening quite rapidly down to the antennae. Frons yellow, brightly so for about one-fourth its extent above antennae, above this a region with a greenish-black reflection which has an ill-defined triangular mark; the last section, which includes the ocelli, is nearly as long as broad and is shining black; a black spot above each antenna.

Type locality: Plummers Id., Md. (Male type, July 19, R. C. Shannon); female allotype, Falls Church, Va., June 21 (F. Knab). Paratypes are from Plummers Id., Md.; Difficult Run, and Dead Run, Fairfax Co., Va.; and North Carolina. For the records of locally collected specimens all of which may be considered paratypes, see pp. 182–183.

Type: Cat. No. 20285, U. S. N. M.

This species, of which a series of 28 specimens is before me, has been

confused with *ribesii*, *grossulariae*, and *xanthostomus*. It differs from *ribesii* and *rectus* in its bright yellow mesonotal side margins; apically pointed third antennal joint; bases of femora in male yellow, and second and third yellow bands of abdomen but little narrowed laterally. It is the only species included in the table having the small bristles on the under side of the middle tarsi yellow instead of black. All the above mentioned specimens agree closely among themselves. Three specimens from Texas agree with this species except for having some black bristles intermixed with the yellow ones on the under side of the middle tarsi and the wings slightly yellowish.

I desire to express my sincere appreciation of the deep interest taken and helpful suggestions made by Mr. Frederick Knab in the work I have undertaken. Through his critical readings of all the papers I have prepared many important changes have been made and faults corrected. It is with great pleasure therefore that I name this species in his honor.

Syrphus rectus O. S.

Osten Sacken * in his work "The North American Species of the Genus *Syrphus*" described *Syrphus rectus* from the White Mts., N. H., and New York; afterwards he placed it as a synonym of *ribesii* L. In discussing *rectus* he stated that he had two forms, a small one in which the female has a brown ring on the hind femur, and a larger form the female of which has the hind femora entirely yellow. In studying local material of *ribesii* and allied species the writer was able to separate a form which agreed with the description Osten Sacken gives for the small variety and with small specimens from the White Mts., N. H.

Slide mounts of the male genitalia of one of these specimens, a European specimen of *ribesii*, and a local *ribesii*, show that the small form is a distict species from *ribesii*. Upon the advice of Messrs. Knab and Banks, Osten Sacken's name, *rectus*, is applied to this species.

But few characters appear to be available to separate *rectus* from *ribesii*. In *rectus* the pile on the thorax is paler and less dense than in *ribesii;* and on the scutellum noticeably sparser; the bands on the third and fourth abdominal segments in the female are quite straight and scarcely narrowed at their ends. In the male the yellow markings on this second abdominal segment in the part produced forward to the basal angles are much broader than in the male *ribesii*. The female of *rectus* has a dark ring on the hind femur just beyond the middle. *Rectus* is noticeably smaller than *ribesii*.

Length of *rectus*, male: 8–9 mm., wing 7–8.5 mm.; of female: 8.5–9 mm., wing 7.5–9.5 mm.

Length of *ribesii*, male: 12–13 mm., wing 10–11.; of female about 13 mm., wing 10–11 mm.

For records of this species in the vicinity of Washington, D. C., see p. 183. Other specimens of this species in the National Collection are from Beverly, Mass.; White Mts., New Hampshire; North Carolina;

* Proc. Boston Soc. Nat. Hist. XVIII, pp. 135–158, 1875.

Michigan; and Missouri. Two specimens from Washington, D. C., were bred from larvae preying on *Aphis euonymi.*

Syrphus ribesii vittafrons new variety.

When he described *S. rectus*, Osten Sacken mentioned four specimens, two males and two females, which had a distinct brown median stripe on the face. No locality was given, but in the vicinity of Washington specimens with this peculiarity appear to be much more numerous than typical *ribesii*, and it is therefore thought best to designate this form by a distinctive varietal name. Besides having the facial stripe the pile on the thorax is more deeply golden.

Type, male, Maryland near Plummers Id., Md., April 17, 1913 (W. V. Warner); allotype, Cabin John, Md., September 13 (F. Knab); paratypes, vicinity of Washington, D. C., for records of which see p. 183.

Type: Cat. No. 20286, U. S. N. M.

The National Collection contains specimens of typical *ribesii* from New Brunswick, Connecticut, Colorado, Washington (State), Alaska, California, and Mexico. Specimens from Alaska are inclined to have longer and much thicker pile on the body.

Brachyopa flavescens Shannon.

This species was described from males. (Insec. Insci. Mens. 3, 1915, p. 144.) The female may be recognized from those of other North American Brachyopa, except *notata*, by its reddish yellow frons and thorax and from *notata* by its nearly bare arista, narrower frons and less elongate scutellum.

Key to the Species of **Brachypalpus** (sensus strictu).

1. Abdomen without crossbands . . . . . 2.
   Abdomen with crossbands . . . . . 3.
2. Posterior margin of fourth abdominal segment yellow, first two joints of fore tarsi and first three joints of middle and hind tarsi orange colored . . . . . *inarmatus* Hunter.
   Abdomen unicolorous; the first joint of the front and middle tarsi yellowish, the following joints and all of the hind tarsi dark . . . . . *frontosus* Lw.
3. Third antennal joint large and blackish; pile on frons. Legs entirely black . . . . . *rileyi* Will.
   Third antennal joint rather small, somewhat reddish; no pile on frons. Legs for the most part reddish brown . . *parvus* Will.

B. inarmatus Hunter.

Eyes in male narrowly separated. Antennae reddish brown, arista lighter. Tips of tibiae and extreme tips of femora yellow; first two joints of fore tarsi yellow, the other black; first three joints of middle and hind tarsi yellow, the others black. Hind tibiae of male unarmed. Thorax brassy with a purplish reflection and with short yellow

pile. Abdomen shining black with a strong purplish reflection; second segment with an opaque spot in the middle; posterior margin of fourth segment orange with golden pile. Wings lightly infuscated anteriorly; anterior cross-vein joins discal cell a little beyond the middle. Length about 12 mm.; wing about 10 mm. Two males: Waldoboro, Me. (J. H. Lovell); Ottawa, Canada.

B. FRONTOSUS Loew.

Head in this species very distinctly triangular shaped, more so than in the others. Eyes in the male barely touching. Antennae dark, faintly reddish; arista yellow. Extreme tips of the femora and the bases of the tibiae yellow. Hind tibiae in male armed with a tooth on under side. Thorax dull aeneous, with whitish pile. Abdomen entirely shining black. Wings somewhat infuscated, the transverse veins clouded. Anterior cross-vein meets discal cell about its middle. Length about 13 mm., wing about 12 mm. Common throughout eastern United States.

B. RILEYI Williston.

Eyes of male scarcely separated; antennae blackish; arista reddish-brown. Dorsum of the thorax dull aeneous, with yellowish white and black pile intermixed. Wings hyaline except for small clouds at base of second vein, on anterior cross-vein and at angle of fifth vein; stigma luteous. Anterior cross-vein but little beyond the middle of discal cell. Abdomen with broad metallic bands on anterior margins of second, third, and fourth segments. Length about 9 mm., wing 8 mm. Males and females: North Carolina (Morrison); Cincinnati, Ohio; Dead Run, Fairfax Co., Va.; common in a small Sphagnum swamp resting on logs (R. C. Shannon).

B. PARVUS Williston.

Eyes distictly separated in male; antennae brownish; third joint much smaller than in *rileyi;* arista yellow. Frons and face brownish, with silvery pile. Dorsum of thorax brassy, with rather long light pile. Abdomen bluish metallic with opaque cross bands on posterior margins of second and third segments; fourth somewhat yellowish on posterior margin. Anterior cross-vein joins the discal cell distinctly beyond the middle. Length 8 mm.; wing 6.5 mm. One male, the type—Colorado.

Records of two rare species that have been obtained since the list was sent to press are: Microdon megalogaster, Piney Branch, D. C., June 17, 1916, G. E. Quinter, and Eristalis flavipes, Beltsville, Md., on flowers of Euthamia graminifolia, September 10, 1916, McAtee.